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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/814,019
Filing Date: March 31, 2004
Appellant(s): LEONIDA ET AL.

Anthony P. Cho
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed June 15, 2009 appealing from the Office action mailed November 17, 2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,316,644	TITTERINGTON ET AL.	5-1994
WO 2004/086541	WIPO	10-2004
4,798,946	FUJII ET AL.	1-1989
6,989,214	MAO ET AL.	1-2006

2003/0179167	KOLLURI ET AL.	9-2003
2004/0091702	HAMILTON ET AL.	5-2004

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-3, 5-9 and 22-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Titterington et al (U.S. Patent 5,316,644) in view of WO 2004/086541 in view of Fujii et al (U.S. Patent 4,798,946).

Titterington et al. teach an electrochemical cell structure comprising a first conductive member (e.g., 10) and a second conductive member (e.g., 10") stacked along an axis (see abstract; Figs. 1 and 3). The conductive members each comprise a central area (11) and a peripheral area (12), the central area comprising a plurality of openings in fluid communication with the openings on an adjacent member. Regarding claims 5 and 6, the first and second peripheral areas comprise holes (13-20).

Titterington et al. do not expressly teach that the first conductive member has a volume on the first peripheral area and the second conductive member has a protrusion on the second peripheral area extending into the volume, and a securing member located therebetween, as recited in claim 1.

WO '541 is directed to an integrated electrically conductive electrochemical cell component. As shown in Figure 3b and described in [0044], two plates are sealed together in their peripheral region and comprise a protrusion and volume structure (25, 30) having a polymeric securing member (35) therebetween. In [0045], it is also disclosed that a seal may be

created at the periphery of the manifold holes of the plates. The joining of the plates may be accomplished using heat lamination, vibration welding or resistive welding techniques (see [0012]).

It is submitted that the artisan would be motivated to use the sealing configuration of WO '541 in the electrochemical cell of Titterington et al. In [0010], WO '541 teaches that "[t]here, therefore, remains a need to provide improved seals for bi-polar or coolant plates, and a process for making such seals, which reduces the disadvantages associated with conventional sealing techniques." Accordingly, the artisan would be motivated to use the sealing configuration of WO '541 in the electrochemical cell of Titterington et al.

However, neither Titterington et al. nor WO '541 expressly teaches that the volume is sized larger than the protrusion prior to insertion of the protrusion into the volume as recited in claim 1.

Fujii et al. is directed to a plastic package for an IC card. In Figures 8, 9, 10, and 12, the reference teaches sealing configurations wherein a protrusion (24) is sized to be smaller than a volume (14) before insertion of the protrusion into the volume. A bonding agent (adhesive) is present in the volume prior to the joining of the surfaces.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the sealing configuration of Fujii et al. in the electrochemical cell of Titterington et al. as modified by WO '541. In column 2, line 48, Fujii et al. teach the following:

> Preferably, the dimensions of the depressions of the engaging portions are larger than those of the projections so that when the two package sections are combined with one another, a gap will be left between at least one portion of the projection and the corresponding depression and the bonding agent will not be forced out of the projection.

Furthermore, the claims would have been obvious because the sealing technique for improving a particular class of devices (electrochemical cells) was part of the ordinary capabilities of a person of ordinary skill in the art, in view of the teaching of the technique for improvement in other situations (IC card packages, as disclosed above).

Regarding claim 3, this claim is a product claim that recites the process by which the adhesion is carried out and is therefore given little patentable weight (MPEP 2113).

Regarding claims 5 and 6, which recite that the volume and protrusion extend at least partially around holes in the peripheral area, it would be obvious to seal the holes (13-20) of Titterington with the volume and protrusion structure disclosed by WO '541 (the latter expressly disclosing manifold sealing in [0045]).

Regarding claims 7 and 9, Figure 3d of WO '541 discloses a first protrusion spaced radially from a second protrusion. Accordingly, it would also be obvious to incorporate this structure into the electrochemical cell of Titterington et al.

Regarding claim 8, it would be obvious to seal the entire circumferential periphery of Titterington et al. with the sealing structure of WO '541 in order to effectively seal the entire circumference of the plates.

Regarding claims 22 and 23, which recite another volume (protrusion) spaced from and extending transversely from the first volume (protrusion), the combination of circumferential sealing and manifold hole sealing in Titterington et al. would read on this subject matter since

portions of the manifold seals would be at approximately right angles to the circumferential seal(s).

Regarding claim 24, the volume of Fujii et al. is sized to accommodate the bonding agent in its liquid state.

Regarding claims 25 and 26, the volume of Fujii et al. forms first and second receiving volumes when the protrusion is disposed in the volume.

Regarding claim 27, which recites another protrusion spaced from the protrusion and forming a tortuous path, it would be obvious to use discontinuous or irregularly spaced protrusions to seal the circumference and/or manifolds of Titterington et al., thereby forming the claimed tortuous path. Furthermore, although it appears to be the intent of the claim language to recite a tortuous path in the x-y direction of the plates (i.e., in the planes of the plates), it is submitted that this language also reads on tortuosity in the z-direction, which is present in WO '541 as modified by Fujii et al.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Titterington et al. in view of WO '541 in view of Fujii et al. as applied to claims 1-3, 5-9 and 22-29 above, and further in view of Mao et al (U.S. Patent 6,989,214).

None of the applied references teaches that the adhesive tape comprises an ethylene acrylic acid copolymer, as recited in claim 4.

Mao et al. teach an ethylene acrylic acid copolymer adhesive tape for use in an electrochemical cell in column 12, line 29.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention. Here, the use of the ethylene acrylic acid copolymer adhesive as disclosed in Mao et al. would render obvious its use as an adhesive in the cell of Titterington et al./WO '541/Fujii et al.

(10) Response to Argument

Appellants assert that the welding technique of WO '541 is improperly combined with the teachings of Fujii et al., because Fujii et al. allegedly destroys an object of the invention of WO '541. Appellants further state that WO '541 "identifies the significance of 'contact area between the mating ribs 25 and grooves 30' because such contact allows ribs 25 and grooves 30 to become 'frictionally engaged,'" and "reducing this contact area as taught by Fujii et al. is against the teachings of WO '541." However, as stated in the above rejection, WO '541 is not limited to a vibrational welding technique, and also discloses ultrasonic welding, laser welding, heat lamination, or "hot bonding techniques" (see [0039]). Thus, in light of these other techniques, in particular the latter two, Appellant's argument is not persuasive. It is further noted that "heat lamination" and "hot bonding" are broad terms that encompass a number of pressing and joining techniques, and do not involve welding. Appellants further state that "improving the seal is clearly an object of WO '541," and that "it is an important object of WO '541 to have an improved seal, which seal would not be provided by the teachings of Fujii et al."

In response, it is noted that Appellants appear to be characterizing an "improved seal" of WO '541 as necessarily comprising a protrusion and a groove in flush contact along the sides and being welded together. However, it is the Examiner's position that the disclosure of WO '541 is significantly broader than Appellants' characterization. On page 4, the reference teaches the following:

> [0013] According to one aspect of the invention there is provided an electrically conductive electrochemical cell component comprising:
>
> [0014] (a) a first coolant plate and an adjacent plate, wherein the adjacent plate is a second coolant plate or a bipolar plate;
>
> [0015] (b) the first coolant plate comprising at least one mating region for mating with a complementary region on the adjacent plate; and
>
> [0016] (c) the first coolant plate and the adjacent plate each comprise a polymer and conductive filler; and
>
> [0017] wherein the first coolant plate is joined to the adjacent plate by a seal formed by the polymer at the mating region and the complementary region.

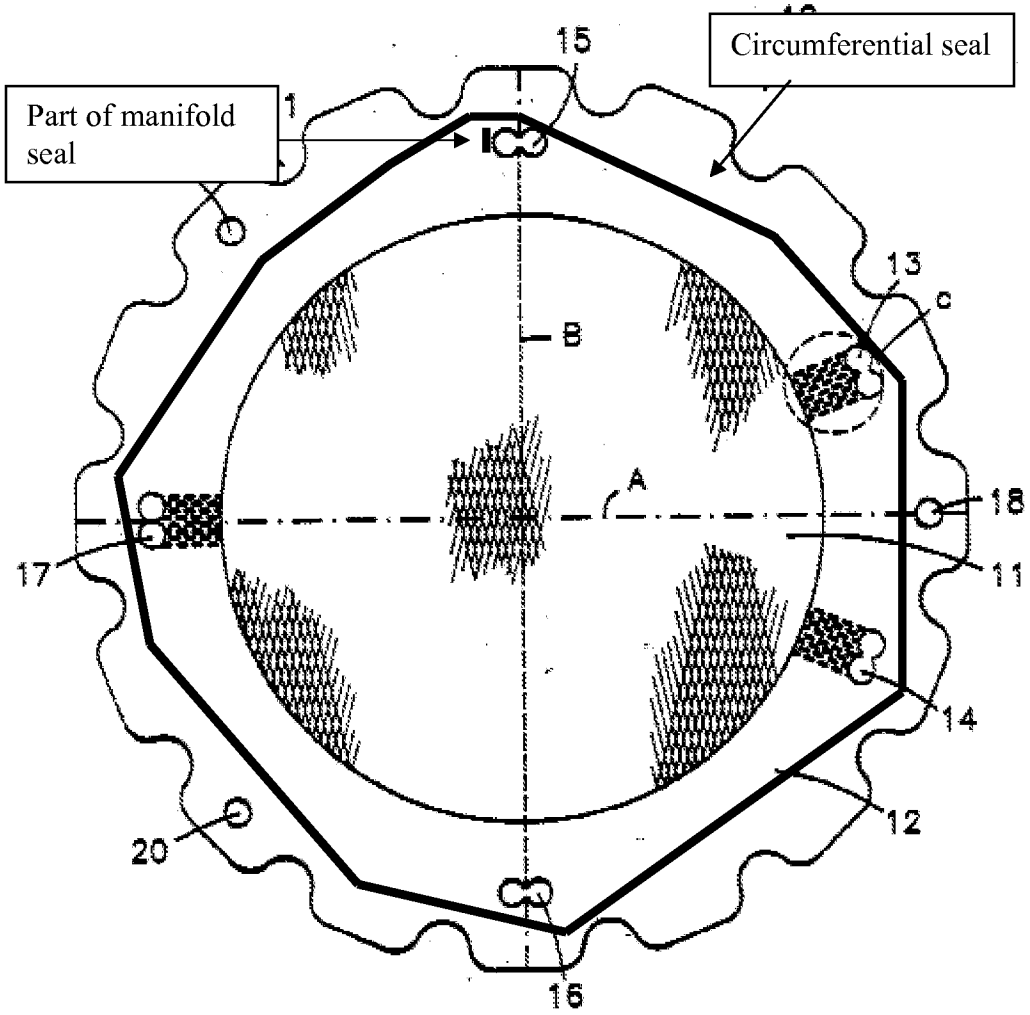
As shown in the above passage, the invention of WO '541 can be broadly characterized as being directed to a plate having a "mating region" that is sealed to another plate having a "complementary region." Thus, the improved seal disclosed by WO '541 appears to merely comprise a mating region and a complementary region, regardless of the specific shapes of the regions. It is acknowledged that the preferred embodiments of the invention have a tight-fitting protrusion/volume structure; however as can be seen from the above passage the invention is not limited to the preferred embodiments. Thus, the use of a slightly larger groove (volume) in WO '541, as suggested by Fujii et al., would not "destroy" the invention of WO '541 as asserted by

Appellants, because this structure would still be "complementary" and "mating" as required by WO '541.

Previously, the Examiner set forth the position that by providing a larger groove, the bonding agent of WO '541 would not be forced out, thereby simplifying manufacturing. In response to this position, Appellants assert in the Brief that "the Examiner, however, fails to explain how manufacturing would be simplified." In response to this assertion, it is pointed out that by preventing excess adhesive/polymer from being forced out of the volume during assembly, the process would be cleaner and therefore more efficient since the amount of excess adhesive would be minimized or eliminated. It is analogous to using too much glue to bond two objects together if the surfaces are exactly flush; this is likely to result in excess glue at the seam that would require a cleaning step. However, if one surface (i.e., a volume) is complementary to the other surface (i.e., a projection) but slightly larger, the same amount of glue could be used without the excess glue being squeezed out, thereby providing a cleaner gluing process. It is further noted that Fujii et al. expressly teaches that such a size difference is "preferabl[e]," so that the "bonding agent will not be forced out of the projection" (col. 2, line 48). Thus, Fujii is believed to provide an explicit motivation for using a volume slightly larger than a protrusion.

With regard to claims 22 and 23, Appellants argue that the Examiner has failed to cite exactly where in Titterington et al. the claimed limitations are found. To clarify, it is the position of the Examiner that it would have been obvious according to the teachings of WO '541 and Fujii et al. to use the protrusion/volume structure around the entire circumference of the plates of Titterington et al., as well as around the manifold holes thereof. Figure 1 from Titterington et al.

is reproduced below, with exemplary sealing volumes/protrusions in accordance with WO '541 and Fujii et al. labeled:



As can be seen from the above annotated Figure, at least a portion of the manifold protrusion or volume would "extend transversely" relative to the portion of the circumferential protrusion or volume adjacent to it. Accordingly, the claim language is met by the combination of references.

Regarding claim 27, Appellants further state that in WO '541, there is no "tortuous path," even in the z-direction, because "ribs 25 are disposed in grooves 30." However, when WO '541

is combined with Fujii et al., the claimed "tortuous path" would be formed due to the space between the rib and the larger groove. In this regard, the arguments made by the Examiner above with respect to the combination of WO '541 and Fujii et al. are believed to be equally applicable to claim 27. Furthermore, as previously set forth on the record by the Examiner, the interpretation of a "tortuous path" being formed in the z-direction is supported by other evidentiary references. See [0043] of U.S. Pre-Grant Publication No. 2003/0179167, which discloses that "the surface of the retainer in contact with the sealing member...may have one or more enclosed raised ridges to seal against a sealing surface and form a seal that provide a tortuous path so that the possibility of fluid leaks is significantly reduced," and paragraph [0006] of U.S. Pre-Grant Publication No. 2004/0091702, which discloses that "some users attempt to address seal quality shortcomings by double- or triple-wrapping the desired item to form a tortuous labyrinth seal path of increased length." These disclosures generally describe the benefits of "tortuous" sealing paths and also indicate to one of skill in the art that such a "tortuous" sealing path can be formed by a plurality of raised obstructions or ridges, which is similar to Fig. 3d of the WO '541 reference relied upon above. Accordingly, for these reasons, it is submitted that the claimed "tortuous path" would rendered obvious by WO '541 in view of Fujii et al.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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